

## Records of the Introduced and Immigrant Chalcid-Flies of the Hawaiian Islands (Hymenoptera).

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(Presented at the meeting of December 6, 1923.)

The purpose of this paper is to provide a list of all known adventive Chalcid-flies found in the Hawaiian Islands, together with records of their distribution on the different Islands and dates of their introduction or first capture. Although host records are not a primary concern of this article, yet many of these records are given incidentally or for the purpose of designating more definitely certain undescribed species.

Records of 144 species are here brought together. Of these at least twenty-four species have been purposely introduced, in three instances subsequently to the first capture of the species, which at the time had not been recognized to occur in the Islands. A considerable number of other Chalcid-flies have been introduced at various times, but records only of those that have been recovered or found established are given here.

In point of time of the first capture or introduction twenty-six species have records extending back before 1902 and seven of these were collected by Blackburn during his residence in the Islands between 1876 and 1882.

During the twelve-year period between 1902 and 1913, inclusive, seventy-three species were first found or introduced so far as information is obtainable at this time; during the last ten years, 1914 to 1923, inclusive, forty-five additional species have been introduced or discovered for the first time. Although the record of first capture in the Islands of any particular species may be several to many years subsequent to its first establishment here, yet it is perhaps significant that a considerably smaller proportion of species were discovered during the last decade than during the preceding twelve-year period, the exact proportion being 4.5 species per year as compared with 6.08 species per year for the preceding period. Possibly the greater proportion for the 1902-1913 period is due to the fact that some of the species had been established for many years

and were finally brought to light because of the greatly increased activity along entomological lines that was inaugurated at about that time, but on the other hand the quarantine established in 1902 has doubtlessly prevented many species from gaining an entrance into the Islands and presumably has been increasingly efficient in this respect.

In the preparation of this paper I have received considerable help from Mr. A. B. Gahan, of the U. S. National Museum, who has generously compared specimens with types and supplied records of specimens in the National Museum. These records are designated by (U. S. Nat. Mus.) in the list.

#### AGAONIDAE.

1. \**Blastophaga psenes* (Linnaeus).

Introduced in 1909 from California and its distribution is limited to a few trees in the Moanalua Gardens near Honolulu.

2. \**Pleistodontes froggatti* Mayr.

Introduced in 1921 from Sydney and recovered in June of the same year. It is now well established in Honolulu and at Waimea, Hawaii.

3. \**Pleistodontes imperialis* Saunders.

Introduced in 1922 from Sydney and recovered in July of the same year. Its present distribution is limited to a few trees in and near Honolulu.

#### CALLIMOMIDAE.

4. *Podagron beneficium* Girault.

One specimen is labelled (by inadvertence?) as taken in November, 1922, at Palolo, Oahu (Illingworth) but I have a suspicion that the record is erroneous and that the specimen is actually from Queensland.

5. *Megastigmus* sp.

One specimen was taken by Fullaway on a window in Honolulu, February 13, 1922, and the species is very likely not established.

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\* Purposely introduced insects are starred throughout the list.

## CHALCIDIDAE.

6. *\*Brachymeria obscurata* (Walker).

Introduced by Koebele from Japan about 1895 and now common on Kauai, Oahu, Maui and Hawaii.

7. *Brachymeria polynesiensis* (Cameron).

Taken by Blackburn in Honolulu and recorded by Ashmead also from Hilo, Hawaii. The species is now rarely found, and I have taken only two specimens, one in Honolulu and another at Honaunau, Kona, Hawaii. Mr. Swezey also found it at Hamakuapoko, Maui, in January, 1910.

8. *Stomatoceras pertorvum* Girault.

First taken in Honolulu by Dr. Perkins in 1900. It is now very common and widely distributed as it was collected at Puunene, Maui, in October, 1904 (Swezey), and at Lihue, Kauai, in September, 1907 (Swezey).

9. *Paranacryptus lacteipennis* (Cameron).

Taken by Blackburn on Oahu and now very rare. There is one female in the National Museum collected by Ashmead, July 6, 1901, at Hilo, Hawaii. It was described by Cameron in 1883 as *Epitranus lacteipennis*.

10. *\*Dirhinus giffardii* Silvestri.

Introduced in 1913 from West Africa, and recovered at Waialae, Oahu, in September, 1921 (Fullaway).

## EURYTOMIDAE.

11. *Eurytoma orchidiarum* (Westwood).

This species was found breeding on *Cattleya* orchids in Honolulu in June, 1914, by Dr. Lyon.

12. *Eurytoma* sp. parasitic on Braconidae.

Recorded by Dr. Perkins as first taken in 1903, but a series collected by him in December, 1903, at Bates Street, Honolulu, belongs to the following species. The earliest records verified by me are as follows: Reared from *Microbracon omiodivorus*

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(Terry) at Naalehu, Hawaii, December, 1905 (Swezey); collected in Honolulu, April, 1907 (Swezey); reared from *Dinocampus coccinellae* (Shrank) at Puunene, Maui, June, 1909 (Terry), and collected at Waipouli, Kauai, March, 1917 (Swezey). It was recorded by Dr. Perkins also as a parasite of *Apanteles*.

13. *Eurytoma* sp. parasitic on Trypetidae.

Reared from *Tephritis crassipes* Thomson in December, 1903, at Bates Street, Honolulu (Perkins); collected at Huehue and in South Kona, Hawaii, in August, 1919 (Swezey), and at Olokele Canyon, Kauai, in September, 1920 (Swezey). It has been reared by Mr. Swezey on Oahu also from *Tephritis swezeyi* Bryan.

14. *Harmolita swezeyi* Phillips and Poos.

This species is phytophagous on Bermuda grass (*Cynodon dactylon* [L.] Pers.). The earliest records that I have been able to verify are as follows: Collected at Puako, Hawaii, May, 1905 (Swezey); at Honolulu in June, 1905 (Swezey); at Kealia, Kauai, May, 1906 (Terry) and at Iao Valley, Maui, August, 1908 (Swezey). Dr. Perkins thought that there might be two species of *Harmolita* in the Islands but I have been able to distinguish only one.

PTEROMALIDAE.

15. *Mormoniella brevicornis* Ashmead.

This species was reared by Terry from Muscoid puparia in Honolulu in December, 1907, and again in April, 1910. It was reared by him from *Chrysomya dux* (Esch.), *Lucilia sericata* (Meig.), *Sarcophaga dux* Thomson and *Sarcophaga barbata* Thomson.

16. \**Muscidifurax raptor* Girault and Sanders.

Reared from *Sarcophaga* puparia collected at Waialae, Oahu, in May, 1907 (Swezey), and from the same host in Honolulu by Terry in August, 1907, and January, 1911. Reintroduced from South Africa in 1913 by Silvestri.

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17. *Zatropis tortricidis* Crawford.

Reared from *Gracilaria marginestrigata* Wlsm. in Honolulu, January and December, 1902 (Perkins); taken in the Alakai Swamp, Kauai, September, 1917 (C. N. Forbes); reared from lantana berries collected at Wailuku and Sprecklesville, Maui, May, 1921 (Swezey); collected at Honokaa, Hawaii (2500 feet), May 28, 1922 (F. X. Williams). It has been reared also from the lantana leaf-miner (*Cremastobombycia lantanella* Busck), and is commonly reared from lantana berries so that it is probably parasitic on *Agromyza lantanae* Froggatt.

18. *Aplastomorpha calandrae* (Howard).

Reared from corn infested with *Calendra oryzae* (Linn.), collected in Honolulu, January, 1910 (Swezey), taken in a corn-house at Hamakuapoko, Maui, January 29, 1910 (Swezey), and reared from *Calendra oryzae* in rat poison, Honokaa, Hawaii, October, 1922 (Pemberton). It was first recorded apparently by Bridwell in 1918 under the name of *Pteromalus calandrae* Howard (Proc. Haw. Ent. Soc., 3, p. 488) and as here determined includes the undetermined Pteromalid mentioned by him. It is now a common parasite in stored products and has been reared in Honolulu from *Mylabris quadrimaculatus* (Fab.), *M. chinensis* (Linn.) and *M. phaseoli* (Gyll.). It has been found by Bridwell also breeding in the open and was reared by him from *Mylabris pruininus* (Horn) and was also taken on Wailupe Ridge, Oahu, May 6, 1917 (Bridwell). In February, 1924, Mr. Ehrhorn found it in his office under conditions indicating that it was breeding on *Catorama mexicana* Chev.

19. *Lariophagus distinguendus* (Förster).

This species was collected at Pahala, Hawaii, May 21, 1915 (Swezey), and on a window in Honolulu, January 22, 1916 (Swezey). During 1916 about half a dozen specimens were taken on windows at the Sugar Planters' Experiment Station and one was taken by Mr. Ehrhorn at his home in Manoa Valley. It has been reared from *Calendra oryzae* (Linn.) infesting rat poison at Honokaa, Hawaii, October, 1922 (Pemberton).

20. *Lariophagus* sp.

An unidentified species of this genus was taken at Honolulu in a shipment of rice from Japan, September 17, 1909 (Lewis). A note attached to the specimens (four females) states that they were found flying around a larva of *Tenebroides mauritanicus* (Linn.). One male taken by Mr. Swezey at Paia, Maui, August 24, 1908, apparently belongs to the same species.

21. \**Lariophagus texanus* Crawford.

Introduced from Brownsville, Texas, in 1921, by Bridwell and Willard and reported by Willard later in the same year to have been recovered on Oahu. It is parasitic on *Mylabris salaei* (Sharp) and doubtlessly on other species of *Mylabris*.

22. *Eupteromalus* sp.

This species was reared by Mr. Swezey from Dryinid cocoons, apparently one to each cocoon, probably of *Haplogonatopus vitiensis* Perkins and possibly also of *Echthrodelpax fairchildii* Perkins, on *Sogata paludum* (Kirkaldy), and also from cocoons of the spider Cryptine, *Arachnoleter swezeyi* Cushman, collected at Kewalo, Oahu, May 4, 1914; also reared by Mr. Swezey from *Gracilaria marginestrigata* Wlsm., mining *Xanthium* at Nawiliwili, Kauai, September, 1921.

23. *Bruchobius* sp.

One female was collected on a window of the Sugar Planters' Experiment Station, September 13, 1916 (Timberlake), and in April and May, 1923, it was reared in large numbers from pigeon peas infested with *Mylabris quadrimaculatus* (Fab.) and *M. chinensis* (Linn.), collected by Mr. Swezey. A small series was also brought back from India by Mr. Fullaway, these specimens having been reared from *Mylabris* larvae at Bangalore in February, 1921, by Subermanian. Mr. Gahan, to whom specimens were submitted, writes me that it is known to him also from the Philippines.

24. *Habrocytus* sp.

Reared from lantana leaf-miner *Cremastobombycia lantanella* (Busck) collected at Lihue, Kauai, May 6, 1921 (Swezey), and

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from the same host collected at Sprecklesville, Maui, May 18, 1921 (Swezey).

25. *Pteromalid* undetermined.

A single female collected in Olokele Canyon, Kauai, by Mr. Swezey, September 5, 1920, shows considerable affinity with both *Bruchobius* and *Zatropis* but at present remains unplaced. It is a comparatively robust species, with a lenticular head, the vertex being strongly declivous behind the ocelli.

26. *Pteromalus fuscitarsis* Ashmead.

Described from a single specimen taken on Lanai by Dr. Perkins in January, 1894, and not recognized by me. As there are no other species of *Pteromalidae* present in the Islands that can be considered endemic, I believe this species must also be an immigrant.

27. \**Pachycrepoideus dubius* Ashmead.

Two females were reared from puparia of the cane-borer Tachinid (*Ceromasia sphenophori* Vill.) collected in Honolulu, April 10, 1911 (Swezey) and one female was obtained from a puparium of a *Drosophila* sp. in rotting pineapple collected in Honolulu, October, 1907 (Terry). Reintroduced by Fullaway in 1914 from the Philippines.

28. *Pachyneuron allograptae* Ashmead.

Reared by Mr. Terry in April, 1904, from the puparia of *Simosyrphus grandicornis* (Macq.), collected on the plantation of the Oahu Sugar Company. More recently a series was reared from sorghum heads collected in Honolulu, July, 1920 (Timberlake), the host presumably being a Syrphid, as the material was infested with *Aphis maidis* Fitch.

Previously recorded as *P. syrphi* (Ashmead), 1881, but that name is preoccupied by *P. syrphi* (Ratzeburg), 1848, which is the same as *P. flavipes* (Förster) according to Kurdumoff. *P. allograptae* Ashmead, 1887, is the next oldest available name for this common North American species.

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29. *Pachyneuron siphonophorae* (Ashmead).

Reared from *Ephedrus incompletus* Provancher in an *Aulacorthum* sp. on rose-bushes, Honolulu, April and May, 1914 (Swezey), and from the same host at Wailuku, Maui, in June, 1916 (Swezey). Reared also from *Diaeretus chenopodiaphidis* (Ashmead) in *Myzus persicae* (Sulzer) on cabbage, Palolo Valley, Oahu, in August, 1917 (Timberlake).

30. *Pachyneuron* sp.

Three females were reared from puparia of *Leucopis nigricornis* Egger collected on sugar-cane in Honolulu in August and September, 1919 (Osborn and Timberlake). Recorded by me in 1920 as *P. anthomyiae* Howard in Proc. Haw. Ent. Soc., 4, p. 330, but it is very distinct from the common *Leucopis* parasite of the United States, which I believe is correctly identified as *anthomyiae*. The local species has practically no neck on the propodeum, and has the petiole of the abdomen smooth and polished and with a distinct prong on each side at about the middle. I have the same species also from California, where it was reared from several species of Coccidae.

## MISCOGASTERIDAE.

31. *Tomocera californica* Howard.

This species was an early immigrant to the Islands and was collected by Blackburn. It was described by Cameron under the name of *Moranila testaceiceps*, and has been found on Oahu, Maui, Molokai, Lanai and Hawaii.

32. \**Tomocera ceroplastis* Perkins.

Found by Dr. Perkins on *Tantalus*, Oahu, and described as a parasite of *Ceroplastes rubens* Maskell in 1906. I have reared what is apparently this species from *Asterolecanium pustulans* (Cockerell) at Honolulu. The species seems to me rather doubtfully distinct from *californica*. According to Dr. Perkins it was introduced by Koebele from China.

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33. \**Scutellista cyanea* Motschulsky.

Introduced by Craw in 1905 from California and now a common parasite of *Saissetia nigra* (Nietner) and *S. hemisphaerica* (Targ.). Although there seem to be no specimens in collections except from Honolulu and vicinity I think it must be widely distributed in the Islands.

## SPALANGIIDAE.

34. *Spalangia cameroni* Perkins.

Found by Blackburn and recorded by Cameron in 1881 as *S. hirta* Haliday. It has been taken on Kauai, Oahu, Maui, Molokai and Hawaii and parasitizes a variety of Diptera including *Stomoxys*, *Lyperosia*, *Sarcophaga*, *Limnophora* and *Dacus*.

35. \**Spalangia philippinensis* Fullaway.

Introduced by Fullaway in 1914 from the Philippines. It was reared in 1916 by Dr. Illingworth in Palolo Valley, Oahu, from various dipterous puparia in hen manure, and in September, 1919, by Willard from *Dacus cucurbitae* Coquillett in Honolulu.

36. *Spalangia* sp.

Reared by Mr. Swezey from horn-fly puparia (*Lyperosia irritans* Linn.) collected at Waialae, Oahu, March 15, 1910, and by Dr. Illingworth in 1916 together with the preceding species. This species may have been purposely introduced, as several other species of *Spalangia* are known to have been brought here, of which we have no exact record, or which have not been recovered.

The other two Hawaiian species of *Spalangia*, *S. lanaiensis* Ashmead and *S. simplex* Perkins seem to be endemic species.

37. *Chaetospora elegans* Westwood.

First taken by Mr. Bridwell in Honolulu in 1913, and found by him at Haiku, Maui, in September, 1918; collected from a store window at Mountain View, Hawaii, October 19, 1917

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(Timberlake). It has been reared from *Calendra oryzae* (Linn.) and from various Bruchids (Mylabridae).

38. *Spalangiid*.

This species belongs to what is apparently a new genus near *Cerocephala* Westwood. I have seen only five specimens, all taken in Honolulu, most of them probably at or near the Sugar Planters' Experiment Station. One was taken by Dr. Perkins in April, 1908, two by Mr. Swezey in 1915 and 1916, and two by myself in 1917 and 1921.

EUPELMIDAE.

39. *Anastatus koebelei* Ashmead.

This species was collected as early as 1892 at Kona, Hawaii, by Dr. Perkins, and described in 1901. In 1906, Perkins recorded it from Oahu as a parasite in the eggs of a Locustid, by which was meant the species now known as *Elimaea punctifera* (Walker). It is probably common on the other Islands, but I have seen no specimens except from Oahu, and one specimen from Iao Valley, Maui, taken by Mr. Bryan in 1919. The male of this species has not been found.

40. *Solindenia picticornis* Cameron.

Collected by Blackburn and now widely distributed throughout the Islands but not known elsewhere. It is certainly an immigrant through commerce, however, as it is remarkably different from the endemic Eupelmids. It is parasitic in the egg-capsules of a Blattid, *Allacta similis* (Saussure) and perhaps of others of the smaller Blattids, as indicated by Dr. Perkins in 1913 (Introduction, Fauna Haw. vol. 1, pt. 6, p. cvi). The male has been reared but is as yet undescribed.

41. *Charitopodinus swezeyi* (Crawford).

The first notice of this species was by Swezey in 1914, who recorded it as a *Eupelmus* sp. parasitic on *Harmolita* in Bermuda grass at Kaimuki. In 1918, Bridwell recorded it also as a parasite of Mylabridae, of *Chelonus blackburni* Cameron and of the Cryptine parasitic in the egg-cocoons of spiders, which has since been described by Cushman as *Arachnoleter swezeyi*. It was taken as early as June, 1905, on Oahu and in

1906 on Kauai. It has been taken by Mr. Muir also at Macao, China. The male remains unknown.

42. *Eupelmella subaptera* (Ashmead).

Described under *Eupelminus* by Ashmead in 1901 from the Waianae Mountains, Oahu. This species is rather rarely taken in the mountains of Oahu, and I presume that it is adventive because it is an isolated form.

43. *Eupelmus* sp.

One female taken by Mr. Swezey in the South Waianae Mountains, Oahu, on November 9, 1919, differs so remarkably from other Hawaiian *Eupelmus* that I believe that it is also adventive. The sculpture is remarkably smooth and polished and the scape is bright yellow.

ENCYRTIDAE.

44. *Xanthoencyrtus fullawayi* Timberlake.

This species was recorded by Fullaway in 1913 as the supposed male of *Pseudococcobius terryi*, but as no separate data were given its first appearance in the Islands is unknown. It was collected on Hawaii in 1916 by Mr. Swezey and in 1922 a large series was reared from *Trionymus calceolariae* (Maskell) collected on sugar-cane in Manoa Valley by Messrs. Swezey, Fullaway and Quan Chock. As many as fifteen parasites sometimes issue from a single mealy-bug. The male has not been found.

45. *Anagyrus nigricornis* Timberlake.

This species was taken on Oahu in March 1910 (Swezey), on Kauai, in 1915 (Swezey), on Maui in 1918 (Swezey), and on Hawaii in 1919 (Swezey, Giffard).

46. *Anagyrus antoninae* Timberlake.

First discovered in Honolulu in 1919 (Timberlake) and not yet found elsewhere in the Islands excepting one specimen taken by Mr. Swezey on Lanihuli, Oahu, in September, 1919. It is known also from Japan.

47. *Anagyrus swezeyi* Timberlake.

First recorded in 1913 by Fullaway and taken on Oahu as early as August 24, 1910, by Swezey; taken at Lihue, Kauai, May 23, 1918 (Timberlake), at Lupe Ditch, Maui, in June, 1918 (Giffard and Fullaway), at Napoopoo, Hawaii, August 10, 1919 (Timberlake), and on Sand Island, Midway, in April, 1923 (Fullaway). It is essentially a grass-inhabiting species and seems to be confined strictly to the lowlands.

48. *\*Leptomastidea abnormis* (Girault).

Introduced from California in the winter of 1915-1916 by Ehrhorn and Fullaway. It is not known to have become established except at Honolulu and vicinity.

49. *Pauridia peregrina* Timberlake.

First recorded by Fullaway in 1913 but taken as early as 1906 by Dr. Perkins in Honolulu. It was taken on Maui in June, 1918 (Giffard and Fullaway), at Kilohana, Kauai, September 1, 1920 (Swezey), and on Eastern Island, Midway, in April, 1923 (Fullaway). It is also known from China, Luzon, Fiji, California and South Africa.

50. *Blepyrus insularis* (Cameron).

Taken on several of the Islands by Blackburn and known to me from Oahu, Maui and Hawaii.

51. *Encyrtus infelix* (Embleton).

Recorded by Ashmead in 1901 as *Encyrtus fuscus* from Hawaii and Lanai, and known to me also from Oahu and Maui. This species is widely distributed both in the lowlands and in the native forests.

52. *Encyrtus barbatus* Timberlake.

Recorded first in 1919 but taken as early as March, 1905, in Honolulu by Mr. Craw. Besides having been collected in a few localities on Oahu this species was taken by Mr. Swezey at Napoopoo, Hawaii, on August 10, 1919. It seems to be confined to the lowlands. It is known to me also from the fol-

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lowing foreign localities besides those listed in 1919: Nagasaki, Japan (T. Ishii); Los Baños, Luzon (Woodworth) and San Marino, California (H. Compere).

53. *Homalotylus flaminus* (Dalman).

This species is represented by a single specimen collected by Koebele in Oahu and recorded by me in 1919.

54. *Quaylea whittieri* (Girault).

Taken as early as September, 1905, by Kotinsky in Honolulu; collected at Kona, Hawaii, by Pemberton in December, 1915, and at Kilauea, Hawaii, by Swezey in June, 1917. It was described by me in 1919 as *Q. aliena* and later merged with *whittieri*.

55. *Zeteticontus perkinsi* Timberlake.

Described elsewhere in this number from a specimen collected by Dr. Perkins in Honolulu in 1906; it has not been taken since.

56. *Microterys kotinskyi* (Fullaway).

First recorded in 1906 by Kotinsky as probably *M. flavus* (Howard) and again by Perkins in 1910 under the latter name. The species is now very common and widely distributed in the Islands and I have seen specimens from Kauai, Oahu, Maui and Hawaii.

57. *Microterys flavus* (Howard).

Of this species I have seen only three specimens, a pair collected on Hawaii by Koebele and one female taken by Mr. Bridwell on Kaumuohona, Oahu, on June 17, 1917.

58. *Aphycus alberti* Howard.

This parasite has been taken a few times in Honolulu and the first record goes back to October, 1914 (Swezey).

59. *Aphycus claviger* Timberlake.

Represented by only two specimens collected on Lanihuli, Oahu, September 3, 1916 (Timberlake). The female is similar to the preceding species but has a little wider scape, and the

abdomen is largely fuscous instead of wholly yellow as in *alberti*. The male is hardly distinguishable.

60. *Pseudococcobius terryi* (Fullaway).

As recorded by Fullaway in 1913 this species was first found by Terry on Maui in June, 1909. It is now known to be widely distributed on Hawaii, Maui, Oahu and Kauai. In July, 1919, I took an apterous female among *Eragrostis* in a very windy place on the side of Iao Valley, Maui. According to a recent letter received from Mercet the generic name *Aphycus* should be used for the group of species represented by *terryi*, but I will not make the change until he has published his conclusion.

61. *Aphycomorpha araucariae* Timberlake.

This parasite of *Eriococcus araucariae* Maskell has been taken only in or near Honolulu and the earliest record goes back to July, 1906 (Kotinsky).

62. \**Pseudaphycus utilis* Timberlake.

Introduced in 1922 from Orizaba, Mexico, and now well established and very effective on *Pseudococcus nipae* on Oahu. It has been distributed also to some of the other Islands.

63. *Xesmatia flavipes* Timberlake.

First recorded and described in 1920 from two specimens taken in widely separated localities in the mountains of Oahu in December, 1918, and June, 1919. More recently I have seen a specimen collected by Mr. Swezey at Kilauea, Hawaii, on August 5, 1919.

64. *Euchalcerinys apicicornis* Timberlake.

First collected by Mr. Swezey on March 28, 1915, and so far it has been taken only in the Koolau Mountains on Oahu. Like the preceding species it is a presumable immigrant.

65. *Aphidencyrus schizoneuræ* (Ashmead).

Recorded by Dr. Perkins in 1910 from Oahu and collected as early as June, 1905, in Honolulu (Swezey). Found at

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Wailuku, Maui, June 18, 1916 (Swezey); at Mountain View, Hawaii, January 21, 1918 (Timberlake), and at Grove Farm, Kauai, in May, 1918 (Timberlake).

66. *Helegonatopus pseudophanes* Perkins.

Recorded in 1910 by Dr. Perkins from Oahu and collected by Terry at Waipahu in May, 1907; taken at Kekaha, Kauai, April 12, 1913 (Swezey); at Hakalau, Hawaii, March 6, 1915 (Swezey) and at Puunene, Maui, December 18, 1917 (Swezey).

67. *Saronotum americanum* Perkins.

Apparently first recorded by both Mr. Swezey and the writer in 1919, but taken as early as November 29, 1912, at Ewa Plantation, Oahu (Swezey); reared from Dryinid cocoons from Hilo, Hawaii, in September and October, 1913 (Swezey); taken at Olowalu, Maui, on December 20, 1917 (Swezey).

68. *Adelencyrtus odonaspidis* Fullaway.

First recorded by Dr. Perkins in 1913 from Honolulu as *Amicroterys* sp. and described by Fullaway in the same year, but taken as early as December 1, 1907, by Swezey at Wailuku; collected at Honaunau, Hawaii, August 13, 1917 (Swezey and Timberlake), and at Waikapu, Maui, March 23, 1924 (Swezey).

69. *Plagiomerus hospes* Timberlake.

So far this species has been collected only in the Koolau Mountains, Oahu, having been taken first by Mr. Giffard at Nuuanu Pali, October 19, 1919, and more recently by Mr. Swezey at Kalihi, Opaepala and Waimalu.

70. *Anabrolepis extranea* Timberlake.

This species has been taken up to the present time only in the Koolau Mountains of Oahu as follows: One female on Tantalus, October 26, 1919 (Giffard); another at the head of Manoa Valley, July 25, 1920 (Dr. Williams); a third on Waialae ridge (1500 feet), November 26, 1922 (Swezey); and another at Waikane on sandalwood, April 13, 1924 (Swezey).

71. *Anicetus annulatus* Timberlake.

First recorded in 1913 by Mr. Fullaway as *Cerapterocerus* sp. and taken by him in Honolulu, April 25, 1912; collected on

Puu Kapele, Kauai, February 14, 1915 (Swezey), and at Kaiwiki, Hawaii, September 22, 1918 (Swezey). The species is known to me also from Sacramento, California, and Chin San, Macao, China.

72. *\*Comperiella bifasciata* Howard.

Recorded by Mr. Fullaway in 1913 as *Cerapterocerus* sp. and reared as early as August, 1905, by Kotinsky from *Aspidiotus* on *Bombax ceiba* Linn. in Honolulu. It was reintroduced in 1908 presumably from China and has been taken apparently only once in recent years, Mr. Fullaway having informed me that he collected a specimen in 1916. The species is common in Japan.

73. *Arrhenophagus albipes* Girault.

Incorrectly recorded by the writer in 1922 as *A. chionaspidis* from specimens taken near Honolulu in October, 1921, by Mr. Ehrhorn. It has since been found commonly in Honolulu and was taken at Kahuku, Oahu, November 8, 1923, by Mr. Pemberton. It was described in 1915 from Hongkong, China, and recorded by Girault also from Gifu and Jamsui, Japan.

APHELINIDAE.

74. *Aneristus ceroplastae* Howard.

This species was recorded by Fullaway in 1913 and by the writer in 1918 as *Prococcophagus orientalis* (Howard). Mr. Gahan of the U. S. National Museum more recently has compared the types of *ceroplastae* and *orientalis* and has pronounced them to be the same. The species was collected in Honolulu and at Waianae, Oahu, by Dr. Perkins in 1902; on October 10, 1905, it was collected at Hana, Maui (Swezey); in 1913 it was recorded from Kona, Hawaii, by Fullaway, evidently from specimens then recently taken; and on February 14, 1915, it was taken on Puu Kapele, Kauai (Swezey).

75. *Coccophagus* sp.

Recorded by Ashmead in 1901 as *Coccophagus lecanii*, but appearing to me to be distinct from that common North Ameri-

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\* Purposely introduced insects are starred throughout the list.

can species. I have examined specimens collected by Dr. Perkins in Honolulu, and two specimens collected on Hawaii by Koebele (his Nos. 1117 and 1560). Although formerly common, the species has become extremely reduced in numbers in recent years, probably because of competition with the preceding species, and the only recent specimen that I have seen is a male, that apparently belongs here, reared by Mr. Swezey from *Eucalymnatus tessellatus* (Sign.), collected on Puu Kapele, Kauai, February 14, 1915.

A *Coccophagus* sp. was recorded in 1893 by Mr. W. G. Wait in the Planters' Monthly, vol. 12, p. 562, from North Kona, Hawaii, as parasitic on *Pulvinaria* and *Lecanium* on coffee. It was called by the manuscript name, *Coccophagus hawaiiensis* Howard, and its identity with the species incorrectly called *lecanii* by Ashmead has been established recently by examination of specimens (two females, with the date, October 24, 1893) in the National Museum.

76. *Coccophagus ochraceus* Howard.

An insect was recorded by Ashmead in 1901 from Kilauea, Hawaii, under this name, but the identification, like several others of Ashmead's, is open to grave doubt. *Ochraceus* has recently become well known to me from California and South Africa, and I have seen nothing similar to it from the Hawaiian Islands.

77. *Centrodora xiphidii* (Perkins).

Described by Dr. Perkins in 1906, but recorded by Swezey in 1905 from Honolulu and Makiki, Oahu; Lahaina, Maui and Koloa, Kauai. It was collected also at Hilo, Hawaii, on October 2, 1913 (Swezey). I have seen no specimens collected earlier than 1905.

78. *Prospaltella koebelei* Howard.

Described by Dr. Howard in 1908 from "Hawaii," his specimens having been reared by Koebele from *Morganella longispina* (Morgan). I have not seen this species.

79. *Prospaltella* sp.

A small black species with a pale yellow scutellum has been

collected on Oahu several times, and is presumably the species recorded by Fullaway in 1913 as *Coccophagus lecanii* from *Aspidiotus rapax* Comst. One female was taken by Dr. Perkins in Honolulu in December, 1908, and I have taken two specimens on Tantalus and Mt. Kaala. In March, 1924, it was reared by Mr. Swezey from *Aspidiotus cydoniae* Comst. on sugar-cane collected at the Experiment Station grounds in Honolulu. In the National Museum I found one female reared by Koebele from an *Aspidiotus* sp. on ohia tree at Olaa, Hawaii (No. 1561), and unfortunately without any date.

80. *Prospaltella* sp.

A wholly orange-yellow species with yellow antennae and legs and hyaline wings, which have a moderately long marginal fringe, was collected by Mr. Swezey from grass on Pearl Harbor Peninsula, Oahu, July 4, 1919.

81. *Encarsia versicolor* Girault.

In 1907, Kotinsky recorded an *Encarsia* sp., which was reared from *Aleyrodes sonchi* Kotinsky, presumably in Honolulu. This record very likely was inclusive of both this and the following species, as both had been reared at that time by Mr. Swezey from this host. Of *versicolor* I have seen a number of specimens reared from *Aleyrodes sonchi* and *Aleyrodes vaporariorum* Westwood, in Honolulu, the oldest specimens having been taken by Mr. Swezey in the Kalihi district on January 27, 1906. In the National Museum I also found specimens reared by Koebele from *Aleyrodes* on lantana as early as February, 1899, at Kona, Hawaii. I have a large series of this species reared in California from several species of Aleyrodidae, and a few specimens from New Haven, Connecticut, out of *Aleyrodes vaporariorum* collected by Mr. B. H. Walden. The species was described from the latter host from Urbana, Illinois.

82. *Encarsia* sp.

This is a bright yellow species with the wings wholly hyaline, the disk of the wing rather broad, without a bare area beyond the stigmal vein, and with the marginal fringe less than one-half of the width of the disk. I have examined specimens of this species reared from *Aleyrodes sonchi*, *A. vaporariorum* and

*A. hibisci* Kotinsky. It was taken in Honolulu, May 27, 1907 (Swezey), in Kona, Hawaii, in December, 1915 (Pemberton), and in Hilo, January, 1918 (Timberlake). In the National Museum there are some much older specimens reared by Koebele from an *Aleyrodes* on coffee at Olaa, Hawaii, in December, 1898.

83. *Aspidiotiphagus citrinus* (Craw).

Recorded by Dr. Howard in 1898 from Honolulu, but the record probably pertains to the following species, at least in part. Reared by G. Compere in Honolulu as early as January, 1899, from *Chrysomphalus rossi* (Mask.) on *Araucaria* (U. S. Nat. Mus.); taken in Kona, Hawaii (5000 feet), by Koebele, host and date not given, Koebele's Nos. 1526, 1527 (U. S. Nat. Mus.); reared from *Aspidiotus perniciosus* Comst. and *A. hederæ* (Vall.) from Makaweli, Kauai, date not given, Koebele's Nos. 1135, 1136, and 1137 (U. S. Nat. Mus.). *Citrinus* at the present time seems to be considerably less abundant in Honolulu than the following species.

84. *Aspidiotiphagus agilior* Berlese.

According to a paper by Mr. A. B. Gahan, of which I have seen a manuscript copy, this species is apparently distinct from *citrinus*. *Agilior* has not been recorded from these Islands heretofore—at least under its present name—although Dr. Howard's record of *citrinus*, in 1898, was presumably at least inclusive of this species. It was reared by Koebele in Honolulu in August and October, 1896, from *Parlatoria zizyphi* (Lucas) and *Fiorinia floriniae* (Targ.) (U. S. Nat. Mus.); from *Lepidosaphes beckii* (Newm.) on orange in Kona, Hawaii, in April, 1898, and at Makaweli, Kauai, in May, 1898 (U. S. Nat. Mus.).

A species of *Aspidiotiphagus* was introduced by Koebele about 1894 from China and Japan, but whether it was this or the preceding species, or both, is unknown.

85. *Aphelinus maidis* Timberlake.

Probably both this and the following species were included by Fullaway in 1913 in his record of *Aphelinus mali*, as both were present in collections at that time. *Maidis* was collected in Honolulu in 1906 by Dr. Perkins, and a mummified cane aphid (*Aphis sacchari* Zehntner) is preserved in the collection

of the Sugar Planters' Station, collected at Lahaina, Maui, September 27, 1905 (Swezey), which was without doubt parasitized by this species, this aphid being commonly attacked by it; it was reared from the cane aphid at Hilo, Hawaii, September 16, 1913 (Swezey); and on May 22, 1918, the writer found the corn aphid (*Aphis maidis* Fitch) parasitized by this species at Grove Farm, Kauai.

86. *Aphelinus gossypii* Timberlake.

The oldest specimen of this species that I have seen was taken in Honolulu on November 22, 1904, by Mr. Swezey, and the species was taken also at Kilauea, Hawaii, by Mr. Perkins in July, 1906.

87. *Aphelinus semiflavus* Howard.

Of this species, I have reared three specimens from material collected on Tantalus, Oahu. From *Toxoptera aurantii* (Fonscolombe), I obtained two females on February 29, 1916, and one female on March 30, 1908, from *Aulacorthum circumflexum* (Buckton).

88. *Aphytis diaspidis* (Howard).

Recorded by Kotinsky in 1905 as *Aphelinus fuscipennis* from Mokuleia, Oahu, and in 1913 by Fullaway as *Aphelinus diaspidis*, but taken in Honolulu by Koebele as early as January, 1899 (U. S. Nat. Mus.). I have seen specimens only from Honolulu.

89. *Aphytis limonus* (Rust).

The *Aphelinus* species incidentally recorded by Girault in 1913 from Honolulu proves to be this species, together with a few specimens of *diaspidis*. These specimens were reared by Koebele, March 10, 1899, from an *Aspidiotus* on oleander in Honolulu (U. S. Nat. Mus.). This species was also reared in Honolulu by Mr. George Compere in January, 1899, from three different species of diaspine scales. *Limonus* was described by Rust in 1915 from specimens collected by Mr. Ehrhorn in 1911. It is a common species in Honolulu, but I have not seen it from any other locality.

90. *Marietta* sp.

First recorded by Fullaway in 1913 from Honolulu, but collected considerably before that time by Dr. Perkins. The earliest specimens that I have seen were taken by Mr. Swezey at Kaimuki, on March 8, 1913; others were taken at Kahuku, Oahu, July 18, 1919, and at Waikapu, Maui, on March 23, 1924, also by Mr. Swezey. It is now a common species on Oahu and occurs in a fully winged and apterous condition. In habits it is a secondary parasite of *Trionymus* and *Antonina* on grasses.

91. \**Marietta carnesi* (Howard).

In 1907, Mr. Kotinsky reported on the introduction of a *Perissopterus* sp. from China, which was reared from *Lepidosaphes* and liberated in Honolulu in the summer of 1906. In 1913, Mr. Fullaway recorded a *Perissopterus* which he had reared from a *Lepidosaphes* sp. at the Federal Experiment Station. The identity of the species concerned in these records is not certain, as I have seen no specimens, but there are grounds for believing that it was *carnesi* Howard. At any rate, I captured a female of this species on February 10, 1924, in Makiki, Oahu, on *Schinus* infested with *Saissetia nigra* (Nietn.), and later reared a few more specimens from material collected at the time. *Carnesi* has been known previously as a secondary parasite of Diaspine scales. It is readily distinguished from the preceding species by the very slender scape, which is no wider than the pedicel.

92. *Eretmocerus corni* Haldeman.

This species was determined by Dr. Perkins for Kotinsky, who recorded it from Honolulu in 1907 as a parasite of *Aleyrodes hibisci* Kotinsky. I have reared this species from the same host collected at Hilo, Hawaii, in January, 1918.

93. *Archenomus perkinsi* (Fullaway).

Described by Fullaway in 1913 from Honolulu, under the genus *Pteroptrichoides* from specimens collected by Kotinsky on August 24, 1906. It apparently has never been found elsewhere in the Islands.

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\* Purposely introduced insects are starred throughout the list.

94. *Pseudopteroptrix imitatrix* Fullaway.

First recorded by Fullaway in 1913 as *Pteroptrichoides* sp. as a parasite of *Howardia biclavis* (Comst.) and still known only from Honolulu.

## SIGNIPHORIDAE.

95. *Signiphora aspidioti* Ashmead.

This species was recorded from Honolulu in 1913 by Mr. Girault as *S. coquilletti* and was reared from several species of *Aspidiotus* in Honolulu by Koebele as early as January and March, 1899 (U. S. Nat. Mus.). There are also specimens in the National Museum reared by Koebele from *Aspidiotus* sp. on ohia at Olaa, Hawaii.

96. *Signiphora* sp.

This is apparently the species recorded by Fullaway and by Muir in 1913 as *Thysanus* sp. from *Aspidiotus* species in Honolulu. It was reared from a *Parlatoria* on avocado at Kaimuki, June 3, 1913 (Swezey), and also reared by me apparently from *Coccus longulus* (Dougl.), although some diaspine scale may have been included in the material. It is distinguished from the following species by having a well-developed discal bristle on the fore-wing and by having the antennal club proportionately shorter and wider.

97. *Signiphora thoreauini* Girault.

One female was collected by Mr. Swezey on May 19, 1917, at Niulii, Hawaii. This specimen has the antennal club considerably longer and narrower than in Californian specimens of this species, but in almost all other respects it agrees very closely.

## TETRACAMPIDAE.

98. *Astichus cyaneus* Ashmead.

This species apparently requires a new generic name, as it certainly is not a true *Astichus* and belongs to a different group from that assigned to it by Ashmead. It was described in 1901 from a specimen taken on Lanai in January, 1894. It was taken on Oahu by Perkins, and much earlier by Blackburn; found also on Maui in 1918, and on Kauai in 1921 by Swezey. It is a

rather rare species occurring in the native forests, and I believe it must be adventive because of its isolated position in respect to the native fauna.

EULOPHIDAE, ENTEDONINAE.

99. *Secodella metallica* (Ashmead).

Described as *Omphale metallicus* in 1901 from specimens taken on Hawaii, Molokai, Oahu, and Kauai. It was taken on Mt. Kaala, Oahu, by Dr. Perkins as early as December, 1892 (U. S. Nat. Mus.). It has been taken also on Maui. Like the preceding species, it has usually been considered endemic, but I believe it has all the earmarks of an immigrant species, it being an isolated species without congeners in the Islands, and occurring at all elevations on many different hosts.

100. *Achrysocharis fullawayi* (Crawford).

Described in 1913 from Honolulu as *Derostenus fullawayi* (sic) and apparently first taken by Fullaway about 1910. It has been reared from *Agromyza pusilla* Meig. collected at Paauhau, Hawaii, January 17, 1918 (Timberlake), and from *Cremastobombycia lantanella* Busck collected at Lihue, Kauai and Ulupalakua and Sprecklesville, Maui, in May, 1921 (Swezey). It has been reared also from *Gracilaria marginestrigata* Wlsm., *Gracilaria hibiscella* Swezey and *Philodoria pipturiella* Swezey.

101. *Achrysocharis* sp.

This species, which has not been previously distinguished from *fullawayi*, was reared by Dr. Perkins as early as January, 1902, in Honolulu, from *Gracilaria marginestrigata* Wlsm. Two females were reared from the same host at Kaimuki, March 8, 1908 (Swezey), and two females were taken at Kekaha, Kauai, in August, 1913 (Osborn). It seems to have become very largely if not wholly replaced by the preceding species, as all the specimens of *Achrysocharis* obtained in recent years belong to *fullawayi*. It is distinguished from *fullawayi* by the considerably coarser reticulation and by the brighter, more brassy green color with purple on the scutellum.

102. *Chrysocharis parksi* Crawford.

Recorded by Crawford in 1913 as *Chrysocharis* sp. from

specimens collected in Honolulu by Fullaway. It was reared from *Agromyza pusilla* Meig. at Kaimuki, June 24-27, 1906 (Swezey), and collected at Pahala, Hawaii, as early as May 6, 1905 (Swezey). In September, 1918, Mr. Bridwell reared it from *Agromyza pusilla* at Haiku, Maui.

103. *Pleurotropis* sp.

This species was reared from the cocoons of *Microbracon omiodivorus* (Terry) in April, 1917, at Honolulu (Bridwell and Timberlake), and has not been recorded heretofore from the Islands.

104. *Entedonine* sp.

This species, which is parasitic in the cocoons of the spider Cryptine, *Arachnoleter swezeyi* Cushman, was taken by Mr. Terry at Waipahu, Oahu, in May, 1907, and at Honolulu in June of the same year. It is now widely distributed on Oahu, but apparently has not been found on the other Islands. It is recorded here for the first time.

105. \**Horismenus* sp.

Introduced by Bridwell and Willard from Brownsville, Texas, in 1921, and recovered by Mr. Willard on Oahu, in 1923.

TETRASTICHINAE.

106. *Melittobia hawaiiensis* Perkins.

Described in 1907 from Honolulu, and the earliest specimen that I have seen was taken by Dr. Perkins on a window at Waikiki, Oahu, in 1903 or 1904.† Mr. Swezey has discovered its work in *Sceliphron* cocoons, also at Kilauea, Kauai, and in July, 1920, obtained specimens from *Odynerus nigripennis* Holm. collected at Keanae, Maui. Taken also in *Sceliphron* nest at Kealahou, Hawaii (3500 feet), August 20, 1919 (Swezey and Timberlake).

107. *Melittobia peles* Perkins.

Described as a variety of the preceding species by Dr. Per-

\* Purposely introduced insects are starred throughout the list.

† The label is obscure, with the final figure rewritten so that it is not evident whether 1903 or 1904 was intended.

kins, who says that it is probably a distinct species. With this I fully agree, as there are good structural characters to separate it in both sexes. Dr. Perkins' unique specimen was collected at Kilauea, Hawaii, in July, 1906. Two females were collected on Mt. Olympus, Oahu, by Swezey, on April 2, 1911, and in July, 1918, I obtained a large series, including males from a larva of *Odynerus nigripennis* collected at Nuuanu Pali, Oahu.

108. *Tetrastichine* near *Melittobia*.

This is the parasite of *Ereunetis flavistriata* Wlsm. recorded by Mr. Swezey in 1909 from Honolulu (Exp. Sta. H. S. P. A., Ent. Bull., 6, p. 29). It resembles *Melittobia* in many ways, but is smaller, more metallic, and the funicle has only two joints. The male, moreover, closely resembles the female. Reared by Mr. Swezey from an *Ereunetis* larva on coconut at Grove Farm, Kauai, September 13, 1907, and taken by him in Honolulu, January 20, 1908. It seems to be a common parasite of *Ereunetis* in Honolulu, and probably is more widely distributed than the records show.

109. \**Ootetrastichus beatus* Perkins.

Introduced from Fiji in 1905 and now well distributed throughout the sugar-cane districts of the Islands.

110. \**Ootetrastichus formosanus* Timberlake.

Introduced from Formosa in 1916 and now distributed to the same extent as *O. beatus*.

111. *Tetrastichus hagenowii* (Ratzeburg).

Recorded by Ashmead in 1901 from Hawaii and Lanai, and probably one of the earliest immigrants of this group of insects, but not taken by Blackburn so far as I am aware. It presumably occurs on all the larger Islands, although I have seen specimens only from Kauai, Oahu, Maui, and Hawaii.

112. \**Tetrastichus giffardianus* Silvestri.

Introduced by Fullaway from West Africa in 1914. The following records of specimens taken in general collecting will be of interest: Collected on Konahuanui, Kaumuohona, and at Pauoa

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\* Purposely introduced insects are starred throughout the list.

Flats, Oahu, in June, 1917 (Bridwell), taken in Iao Valley, Maui, on September 5, 1919 (Bryan).

113. *Tetrastichus* sp.

Collected at Makiki, Oahu, January 25, 1907 (Swezey), and now rather common in Honolulu. Most of my specimens were taken on store windows, although the species also occurs in the open. It is distinguished from other Hawaiian species by the median scutal groove, the dark femora and yellow scape and pedicel.

114. *Tetrastichus* sp.

Of this species I have seen only one specimen, collected by me from a store window at Kaimuki, Oahu, on January 5, 1918. It is somewhat similar to *hagenowii*, but is much more depressed, more metallic, and with a smoother sculpture. It seems to be closely allied to *T. metallifer* Masi.

115. *Tetrastichus* sp.

Taken by Dr. Perkins at Kilauea, Hawaii, in June, 1906, and there is a note attached to the specimen to the effect that it was apparently associated with *Eurytoma* or a Pteromalid parasitic on Diptera, and that the species is widely distributed, as he had taken it on Tantalus, Oahu. Mr. Giffard has also reared this species at Kilauea from *Tephritis* puparia in *Raillardia* flower-heads, April, 22, 1920. Among Hawaiian species it is most similar to the third species recorded above (No. 113), but it has the propodeum much shorter, the oral margin yellow, the scape and pedicel dark, and the femora yellow at base and apex.

#### ELACHERTINAE.

116. *Elachertus advena* Timberlake.

This species will be described elsewhere in the near future. First recorded by me in 1919 as *Elachertus* sp. from specimens reared by Professor Crawford in Honolulu from *Hypothenemus*, but taken as early as June 10, 1917, on Tantalus by Mr. Bridwell. Taken at Waikee, Maui, September 4, 1919 (Bryan), and a good series, including males, was taken by Mr. Fullaway on Sand and Eastern Islands, Midway, in April, 1923.

117. *Elachertus* sp.

A small series of this species, which has not been recorded heretofore, was reared by Mr. Giffard on ~~July~~<sup>September</sup> 9, 1906, from an unknown host collected in Moanalua Valley, Oahu.

118. *Elachertine*.

Recorded by me in 1919 as a *Rhopalotus* sp., but now placed in a different group. One female was swept from grass and weeds near Lihue, Kauai, May 23, 1918 (Timberlake); four females were collected by Mr. Swezey at Honaunau, Hawaii, August 13, 1919; and one female was taken by Mr. Fullaway in Honolulu on December 4, 1920.

119. *Cirrospilus* sp.

Reared from *Cremastobombycia lantanella* Busck at Lihue, Kauai, May 6, 1921, and from the same host at Sprecklesville, Maui, May 18, 1921 (Swezey); reared from *Gracilaria marginestrigata* Wlsm. at Kaimuki, Oahu, in April, 1922 (Timberlake).

## EULOPHINAE.

120. *Diaulinus* sp.

Recorded by Crawford in 1913 from Honolulu, but reared as early as November 30, 1906, by Mr. Swezey at Kaimuki, Oahu, from *Gracilaria marginestrigata* Wlsm.; reared by Mr. Bridwell in September, 1918, from *Agromyza<sup>a</sup> pusilla* Meig. at Haiku, Maui.

121. *Notanisomorphomyia* sp.

This is the species recorded by me in 1922 as *Eulophus* sp. One female was taken in Honolulu, May 28, 1917, probably by Mr. Swezey; it was reared from *Cremastobombycia lantanella* Busck, collected by Mr. Swezey at Lihue, Kauai, May 6, 1921, at UluPalakua, Maui, on May 17, 1921, and at Huehue, Hawaii, on July 27, 1921. This species has been reared also from *Gracilaria marginestrigata* Wlsm., *Gracilaria neraudicola* Sw., *Euhypsozoma trivittella* Sw., *Bedellia orchilella* Wlsm., etc. Although it has been reared and collected in considerable numbers, no males have yet been found.

122. *Pseudopheliminus* sp.

This species was first taken by Mr. Swezey, who collected a male on Waialae Ridge, Oahu, November 26, 1922; it was reared from *Gracilaria hawaiiola* Swezey collected at Hanalei, Kauai, on March 16, 1923 (Swezey); one female was taken on Nihoa by Mr. Bryan on June 14, 1923, and one at Wailuku, Maui, by Mr. Swezey on December 9, 1922. I have reared it also from *Gracilaria marginestrigata* collected at Pearl Harbor Peninsula, Oahu, in March, 1923, and at Kaimuki in January and February, 1924.

## TRICHOGRAMMATIDAE.

123. *Brachistella lutea* (Fullaway).

Described by Fullaway in 1914 as *Jassidophthora lutea* from specimens reared from the eggs of *Draeculacephala mollipes* (Say) at Honolulu apparently early in 1913, as Mr. Muir exhibited specimens at the meeting of the Entomological Society on February 6, 1913; it was reared also from the eggs of *Conocephalus saltator* (Saussure) collected in Honolulu by Mr. Swezey in January, 1913, and taken at Ewa, Oahu, by Mr. Swezey on August 13, 1921.

124. *Oligosita hilaris* (Perkins).

Described by Dr. Perkins in 1910 as *Westwoodella hilaris* and taken by him in Honolulu as early as January, 1904. I have seen only a few specimens including the type, all of which were collected by Dr. Perkins.

125. *Oligosita caerulocephala* (Fullaway).

Described by Fullaway in 1914 as *Westwoodella caerulocephala* from specimens taken at the same time and under the same circumstances as the types of *Brachistella lutea*, but it was reared by Mr. Swezey also in 1912 from Cicadellid eggs in sedge at Honolulu.

126. *Ittys* sp.

Reared by me from the eggs of *Nesophrosyne maritima* Kirkaldy in *Dodonaea* leaves collected at Makua, Oahu, July 16, 1916.

127. *Aphelinoidea xenos* Timberlake.

Reared by Mr. Swezey from the eggs of *Sogata paludum* (Kirkaldy) collected at Kewalo in Honolulu on August 18, 1913, and May, 4, 1914.

128. \**Uscana semifumipennis* Girault.

Introduced in 1910 from Texas and first reported to be established at Honolulu by Fullaway at the meeting of the Entomological Society held February 1, 1921; found at Kona, Hawaii, in July, 1912, by Fullaway. It has not been reported from the other Islands, but doubtlessly occurs also on Maui and Kauai.

129. *Ufens* sp.

This parasite of the eggs of *Elimaea punctifera* (Walker) and *Holochlora japonica* Brunner was first recorded by Dr. Perkins in 1910. All the specimens that I have seen were taken in or near Honolulu except one or two specimens taken by Mr. Swezey at Barber's Point, Oahu, on December 23, 1923.

130. *Trichogramma semifumatum* (Perkins).

Described by Dr. Perkins in 1910 as *Pentarthron semifumatum* from Honolulu and Kilauea, Hawaii, but collected as early as June, 1906, at the latter locality; reared from undetermined Noctuid eggs on lichens on a dead tree, Haleakala, Maui (6000 feet), in July, 1919 (Timberlake). Not known from Kauai, but presumably occurring there.

131. *Trichogramma minutum* Riley.

Described by Dr. Perkins in 1910 as *Pentarthron flavum* from Honolulu and renamed *T. perkinsi* by Girault. Recorded as *T. pretiosa* in 1907 by Mr. Swezey, who reared specimens from the eggs of *Omiodes meyricki* Swezey collected at Honomu, Hawaii, on March 21, 1907, and who also took specimens in Honolulu a few days later. Some poor specimens with unexpanded wings reared by Mr. Swezey from the eggs of *Anomalochrysa* at Kilauea, Hawaii, on September 28, 1913, apparently belong to this species. It is commonly found also in the eggs of *Amorbia*, *Lycaena*, *Herse*, *Vanessa*, etc. The earliest specimens

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\* Purposely introduced insects are starred throughout the list.

seen were reared by Koebele in Honolulu in the summer of 1900 from the eggs of *Omiodes blackburni* (Butler) (U. S. Nat. Mus.).

132. *Megaphragma mymaripenne* Timberlake.

A few specimens of this remarkably minute species were taken by Mr. Pemberton, who found them associated with a thrips in the forest at Mountain View, Hawaii, late in January, 1920.

MYMARIDAE.

133. *Alaptus immaturus* Perkins.

Recorded by Dr. Perkins in 1910 from Oahu and reared as early as January 6, 1905, by Mr. Terry at Oahu Sugar Company. There seems to be no doubt that it was unintentionally introduced from Queensland at the time that the leafhopper egg parasites were being established. It was taken at Hilo, Hawaii, on March 8, 1913, by Mr. Swezey.

134. *Alaptus globosicornis* Girault.

Recorded by Girault from Honolulu on a single specimen taken August 3, 1900, and the variety *hawaiiensis* was based by him on this specimen. Specimens that I have seen reared from the eggs of the common wingless Psocid that infests insect collections (*Atropos divinatoria*) are uniformly greyish, with the abdomen paler. In life they are decidedly blackish in color, with the abdomen much more dilutely pigmented and appearing translucent dusky whitish, especially in the male. This coloration agrees reasonably well with the original description of *globosicornis*. The *Alaptus* recorded by Mr. Swezey from Psocid eggs in the nests of *Megachile* from Koko Head, Oahu, I believe must be this species, as I have reared specimens under the same conditions. The male has the second funicle joint distinctly smaller than the joint on either side. One male was taken by Mr. Osborn at Hakalau Plantation, Hawaii, in May, 1914.

135. *Alaptus* sp.

One female taken by Mr. Osborn at Hakalau Plantation with the male of *globosicornis* recorded above and two males taken by Mr. Swezey on a window in Honolulu, November 28, 1915, belong to a species heretofore unrecorded from the Islands.

The female differs from *immaturus* in its more dusky color and much shorter antennae and from *globosicornis* in its more yellowish color and in having the funicle joints much less moniliform. The fore-wings in both sexes have a median discal row of six to eight strong setae on the apical half.

136. *Leimacis peregrina* Perkins.

Described in 1910 from specimens taken in Honolulu. I have not seen this species.

137. *Gonatocerus mexicanus* Perkins.

Recorded by Mr. Swezey in 1916 from specimens reared from the eggs of *Draeculacephala mollipes* (Say) collected at Kapiolani Park, Honolulu, on August 26 and 27, 1915; one female was taken by Mr. Swezey on sugar-cane in Honolulu on October 14, 1914.

138. *Gonatocerine*.

One female taken by Mr. Swezey on a window in Honolulu on November 28, 1915, has the antennae very long, slender and ten-jointed. The fore-wing is clavate, with a long fringe only at the apex and with about three irregular rows of discal setae on one surface and two submarginal rows on the other surface, each row being composed of about six setae and confined to the broadened apical part of the wing. The specimen is only 0.24 mm. long and has the antennae, legs, and wings considerably longer than the body. Another specimen was taken by me in the entomological laboratory of the Sugar Planters' Station on March 25, 1924.

139. \**Anagrus frequens* Perkins.

Introduced in 1904 from Queensland and now common and widely distributed in the Islands. It attacks the eggs of other Delphacids besides *Perkinsiella*, and has been reared from the eggs of *Peregrinus maidis* (Ashm.), *Sogatia paludum* (Kirk.), *Kelisia sporobolicola* Kirk., and <sup>*Liburnia*</sup> ~~*Liburnia*~~ *leahi* (Kirk.). This species has been synonymized with *A. armatus* (Ashmead) by Mr. Girault, and perhaps correctly so, although I prefer to use the name *frequens* at present.

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\* Purposely introduced insects are starred throughout the list.

140. *Anagrus* sp.

Recorded by Fullaway in 1917 from specimens reared from the eggs of *Peregrinus maidis* on corn in Honolulu in the summer of 1916. This species is black, with the base of the abdomen yellow, and the wings are very broad as compared with *frequens*.

141. \**Paranagrus optabilis* Perkins.

Introduced in 1904 from Queensland and widely distributed in cane fields throughout the Islands, although now much less common since the introduction of *Cyrtorhinus mundulus* (Breddin).

142. \**Paranagrus perforator* Perkins.

Introduced in 1904 with the preceding species, but lost sight of in recent years. The only specimens that I have seen were reared from the eggs of *Aloha impomoeae* Kirkaldy collected by Mr. Swezey in Makiki Valley, Oahu, on March 2, 1906.

143. \**Paranagrus osborni* Fullaway.

Introduced in 1916 from Los Baños, Luzon, Philippine Islands, as a parasite of *Peregrinus maidis* (Ashm.). It is probably well established, although difficult to distinguish from *optabilis*.

144. *Polynema reduvii* Perkins.

It was reared by Mr. Swezey on August 20, 1905, from the eggs of *Reduviolus capsiformis* (Germ.) in Honolulu; found by Mr. Terry at Kilauea, Koloa and Makaweli, Kauai, in November and December, 1905; recorded by Dr. Perkins in 1910, also from Hawaii; collected by Mr. Fullaway in April, 1923, on Sand and Eastern Islands, Midway, and on Ocean Island. I presume that the Mymarid, recorded by Fullaway in 1914 from Laysan, is this same species.

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\* Purposely introduced insects are starred throughout the list.